National Institute of Environmental Health Sciences

The impact of summer temperatures and heatwaves on mortality and morbidity in Perth, Australia 1994-2008

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Abstract:

Climate change projections have drawn attention to the risks of extreme heat and the importance of public health interventions to minimise the impact. The city of Perth, Western Australia, frequently experiences hot summer conditions, with recent summers showing above average temperatures. Daily maximum and minimum temperatures, mortality, emergency department (ED) presentations and hospital admissions data were acquired for Perth for the period 1994 to 2008. Using an observed/expected analysis, the temperature thresholds for mortality were estimated at 34-36 degrees C (maximum) and 20 degrees C (minimum). Generalised estimating equations (GEEs) were used to estimate the percentage increase in mortality and morbidity outcomes with a 10 degrees C increment in temperature, with adjustment for air pollutants. Effect estimates are reported as incidence rate ratios (IRRs). The health impact of heatwave days (three or more days of >/Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)35 degrees C) was also investigated. A 9.8% increase in daily mortality (IRR 1.098; 95%CI: 1.007-1.196) was associated with a 10 degrees C increase in maximum temperature above threshold. Total ED presentations increased by 4.4% (IRR 1.044; 95%CI: 1.033-1.054) and renal-related ED presentations by 10.2% (IRR 1.102; 95%CI: 1.071-1.135) per 10 degrees C increase in maximum temperature. Heatwave days were associated with increases in daily mortality and ED presentations, while total hospital admissions were decreased on heatwave days. Public health interventions will be increasingly important to minimise the adverse health impacts of hot weather in Perth, particularly if the recent trend of rising average temperatures and more hot days continues as projected.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Temperature

Air Pollution: Interaction with Temperature, Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): NO2

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal, Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Mental Health/Stress, Morbidity/Mortality, Respiratory Effect, Urologic Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): cardiovascular emergency department visits

Mental Health Effect/Stress: Other Mental Disorder

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory emergency deptartment visits

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified